

Weather Home Companion

Inside This Issue:

Warmest March on Record	1
Weather Ready Nation	1
Dual Polarization Radar	3
Radar Hardware Changes	3
New Fischer-Porter Automated Rain Gauges Installed	4
WxCODER	5
The Power of None: Why Zeros Matter	6
What is Metadata?	7
Summer Safety and Awareness	8
Mild Winter Leads to Record Warm Spring 2012	10
River Forecast Webpage Enhancement	11

Weather Home Companion is a semiannual publication of the National Weather Service office in the Quad Cities.

Warmest March on Record

Tim Gross

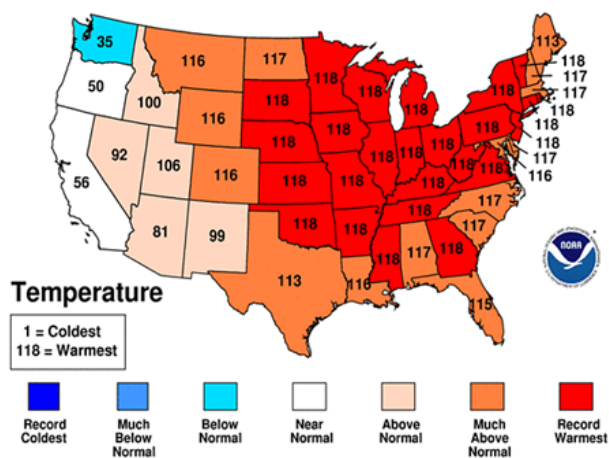
Record breaking temperatures were seen across much of the Midwest during the month of March. These warm temperatures contributed to the warmest March on record for the contiguous United States, a record that dates back to 1895. More than 15,000 warm temperature records were broken during the month of March.

The average temperature for the United States in March was 51.1°F, which was 8.6 degrees above the 20th century average for March and 0.5°F warmer than the previous warmest March in 1910. Twenty five states had their warmest March

(Continued on page 2)

March 2012 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



This graphic shows statewide temperature rankings for March 2012, based on 118 years of data. States in red had the warmest March temperatures on record.

Weather Ready Nation

Steve Kuhl

The National Weather Service realizes there is a long road ahead of us until we are truly a Weather-Ready Nation. In fact, building a Weather-Ready Nation requires the action of every person and community. When we see devastating tornadoes, windstorms, floods, hurricanes, wild fires, and winter storms, the NWS' challenge, along with their emergency management and media part-

ners, looms large. But I believe that each and every person in Iowa, Illinois, and north eastern Missouri can be a powerful force when it comes to severe weather-readiness.

The NWS lives and breathes the force of nature every day. From fair weather forecasts to the tireless support provided during emergency situations, the NWS

never bows to the weather, no matter how severe.

When we combine two things – an empowered public and the continued operational improvements made under the NWS Weather-Ready Nation initiative – we can transform the way the country responds to severe weather and preparedness.

Warmest March on Record

(Continued from page 1)

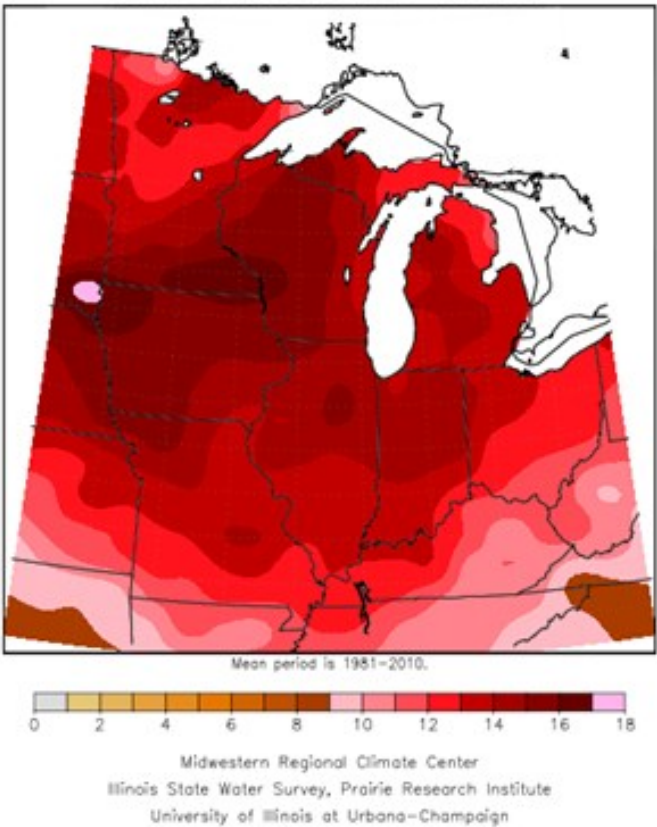
on record, with an additional 15 that had one of their top 10 warmest March on record.

Local Records

Many temperature records were broken for eastern Iowa, northwest Illinois, and north-east Missouri during March 2012. Moline and Dubuque both had their warmest March on record. Moline’s average temperature for March was 53.3 degrees, which broke the previous record of 49.8 degrees set in March 1910. Dubuque’s average temperature was 50.2 degrees, which broke the previous record of 47.7 degrees set in March 1910. There were also several consecutive days where record warm temperatures were broken. The table below shows the days when record temperatures were broken at the sites where climate records are maintained in eastern Iowa and northwest Illinois.

The number of consecutive days of broken records was the longest stretch at all sites for the month of March. However, it was not the longest stretch of broken records. The month of July 1936 saw more consecutive days of record warm temperatures at Burlington, Dubu-

Average Temperature (°F): Departure from Mean
March 1, 2012 to March 31, 2012



que, and Moline. Cedar Rapids, however, did in fact break its longest stretch of record temperatures with 7 consecutive days. The table on the left shows the number of days in a row of record temperatures for March 2012 compared to July 1936.

Record Warm Spell

Number of consecutive days of record high temperatures, March 2012 compared to July 1936:

	March 2012	July 1936
BRL	4	14
CID	7*	4
DBQ	5	6
MLI	7	11

*All time record

BRL = Burlington

CID = Cedar Rapids

DBQ = Dubuque

MLI = Moline

	MAR 14	MAR 15	MAR 16	MAR 17	MAR 18	MAR 19	MAR 20
BURLINGTON	79 76/1995	81 77/1995	82/1945	82 78/1903	82 80/1918	81 79/1921	80 78/1921
CEDAR RAPIDS	75 75/1995	79 76/1995	82 79/1945	82 77/1966	82 79/1918	81 80/1921	77 76/1938
DUBUQUE	75 72/1995	78 71/1935	78 78/1945	81 78/1894	80 77/1918	77/1921	80 77/1921
MOLINE	78 77/1995	81 77/1995	82 82/1945	82 78/1894	83 76/1918	79 78/1921	82 77/1921

Dual Polarization Radar

Andy Ervin

The NWS Quad Cities' radar was upgraded this past March, to include the ability to view both horizontal and vertical shapes of objects it detects.

This technology, commonly called "Dual-Pol", will provide new radar information. For meteorologists, this will be a great tool to help determine rain vs. hail, rain vs. snow, and even verify a tornado's existence. In addition, it will help with estimating rainfall amounts and determine when hail or snow is mixed with the rain. Rainfall estimates from Dual-Pol radars account for snow and hail within an event, and help to more correctly produce estimates of how much rainfall occurred. This will improve the NWS' ability to issue flash flood warnings more accurately.

A fun and informative NWS internet video is available which explains the upgrade to our radar system. Please take a few minutes to type this

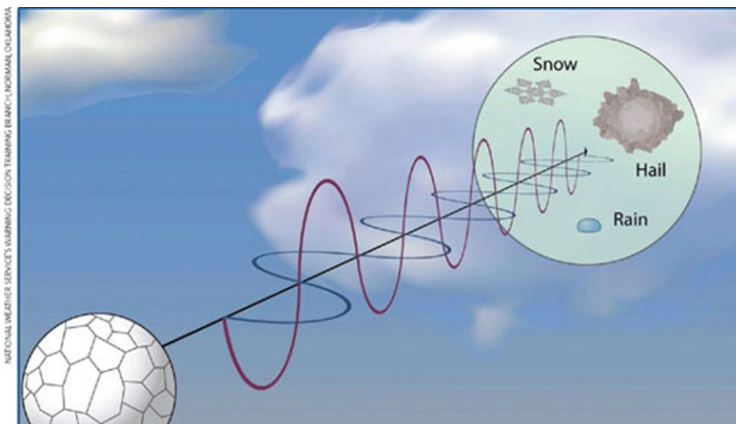


Illustration of the dual polarity of microwaves energy transmitted and received by a dual pol doppler radar. In dual polarity, the energy is emitted in both vertical and horizontal orientation, helping the radar better determine the shape and characteristics of meteorological phenomena, such as rain, snow, and hail.

...the radar should improve the NWS' ability to issue flash flood warnings more accurately...

into a web browser, or if you're viewing this article online, click on the following link:

www.youtube.com/watch?v=tX6LH_I3P3Y

Radar Hardware Changes

Matt Lemon

Along with providing more accurate weather information, the Quad Cities Doppler Radar underwent significant hardware changes. This included having to split the signal transmitted from the radar from one to two signals.

This was done through waveguide modifications. A waveguide is rectangular aluminum tubing that carries the signal from the transmitter to the feed horn (the feed horn is centered on the radar dish and transmits and receives the radar signal). The radar receiver was also moved right next to the radar dish which makes it much more sensitive in identify different types of weather. The time it took to complete the Dual-Pol modification was 6 days.



Photograph of a WSR-88D Doppler radar dish antenna. This photo shows the back side of the antenna and its supporting pedestal.

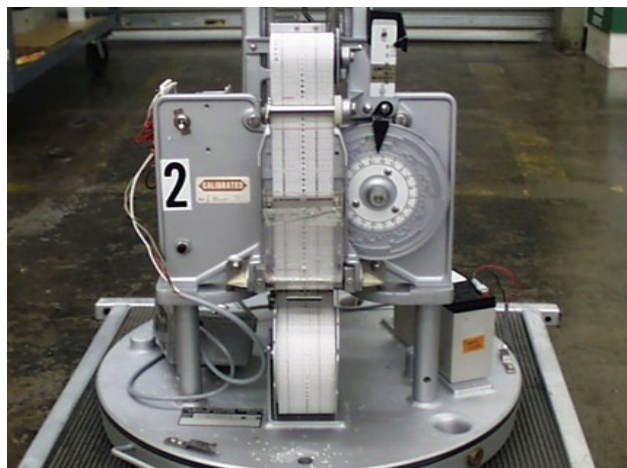
...The time it took to complete the Dual-Pol modification was 6 days...



New Generation Fischer-Porter Automated Rain Gauges Installed

Tom Olsen

During the last few months, the 1950s era tape-fed automated rain gauges (photograph on the right), were replaced with a new generation electronic gauge (below right). Currently, the National Weather Service in the Quad Cities is responsible for maintaining 22 of these automated systems.



Current Fischer-Porter Recording Gauge.

...Accuracy will improve, measuring rain from the nearest .10, to the nearest .005 inches...

Improvements

The new system uses a 12 volt battery instead of a 6 volt battery and its accuracy will improve, measuring rain from the nearest 0.10 inches, to the nearest 0.005 inches

New Procedures

Instead of removing the tape and mailing it to our office after each month, observers will download the data onto a USB Flash Drive (See photo on page 5). They can then send us the data one of two ways. First, the most cost efficient way, is by emailing us the data from the USB drive. The second way is by mailing us the USB drive in pre-paid envelopes. After we have downloaded the data at our office, we will mail back the USB Flash Drive in time for observers to download the data for the next month. These two options will be covered more during our installation and training date.



New FPR-E Recording Gauge.

(Continued on page 5)

New Generation Fischer-Porter Automated Rain Gauges Installed



Flash Port Drive on the new FPR-E Recording Gauge.

(Continued from page 4)

Installation

The installation time break-down at each site was as follows;

- Swap out, set up, and recalibrate: 2 hours
- Capture new metadata: 30 minutes
- Train the observer: 30 minutes

-Thanks

Note: If you are a Cooperative Weather Observer not currently using WxCoder or IV-ROCS telephone system and are interested in using it, please send an e-mail to:

thomas.olsen@noaa.gov;

please be sure to include your **Station Name**, **Station Number** and a **phone number** to contact you.



Tom Olsen

WxCODER is the official web-based entry system for the National Weather Service's Cooperative Observer Program. Combined with IV-ROCS, or Interactive, Voice, Remote, Observation, Collection, System, (pronounced "ivy rocks"), the telephone entry system, WxCODER offers the means for daily entry of weather records for COOP volunteers. WxCODER is sponsored by the National Oceanic and Atmospheric Administration (NOAA) through the National Weather Service, the Regional Climate Center Program and the National Climatic Data Center.

Highlights of the System

- Improved real-time quality control of observations, minimizing errors.
- Eliminates the need to send in paper observation forms each month.
- Interfaces with the IV-ROCS telephone system for backup purposes. If you are going to be out of town and don't want to have your

backup observers logging into your account (or if your internet connection is down), IV-ROCS would be used to relay the observations, and the data would be imported into WxCODER for you.

- Within five minutes, your observation is received by the NWS office and the River Forecast Center for input into River Flood forecasting

Transmitting Observations

Several techniques are available for you to send your daily observations. For those of you who currently do not do this, we would greatly appreciate it if you would begin sending your weather data daily. Daily reports are used for river forecasting, and for composing summaries for external distribution like the media.

IV-ROCS is an automated telephone system that allows you to enter your observed data. The system codes the observations, and they are transmitted to the NWS for relay around the network.

(Continued on page 6)

WxCODER

(Continued from page 5)

WxCODER uses a computer with internet access for entering data onto a special home page. This system also has quality control to avoid observation errors (e.g. low temperature warmer than high temperature). The WxCODER system allows you to print your B-91 form directly from the WxCODER page

If you are an observers and do not have access to any of the above, you may phone in observations to us using our 800 number.

Regardless of how you send your observations, there are some things to keep in mind:

- **Do not send in your observation more than a half hour before your coded observation time.** If you do, then your observation will not be recognized by our computer.

- **Please use the correct value for "trace".** For IV-ROCS, press the * (star) key at the prompt. For WxCODER, enter a "T" at the appropriate prompt.
- **Please use the correct value for below zero temperatures.** For IV-ROCS users, this is coded by pressing the star key before the number (e.g. *18 for a temperature of -18 degrees). In WxCODER, enter the value using a negative sign.
- **If no precipitation is reported, do not include a precipitation type code.** However, go ahead and send the precipitation amount of 0.00 .
- **Report the precipitation type code.** (Applies to IV-ROCS.) If more than two precipitation types are observed, you will be asked one at a time. Any code values of 5 through 9 will prompt the system to ask you to enter a snowfall value.

...WxCODER has quality control to avoid observation errors...

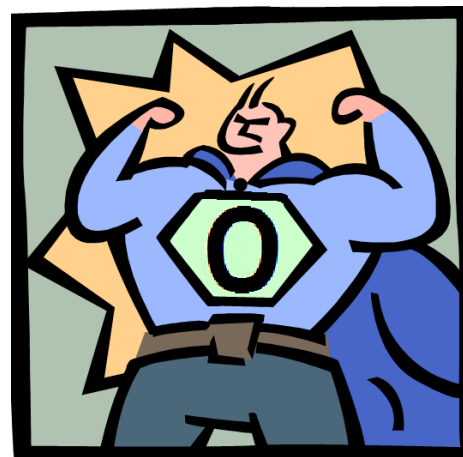
The Power of None: Why Zeros Matter

Terry Simmons

Zero, that little character that looks like an "O", is a powerhouse when it comes to a weather observation. When observers discover a dry rain gage they may think there is nothing to report. After all, nothing has no quantitative value. Nada implies no importance. Therefore, the observer may surmise that leaving a blank space in the observing form is the same thing as reporting a zero because nothing was there.

Cooperative weather observations are a commodity with immediate and long term value. Recordings of temperature and precipitation may be used by insurance agents, construction and utility companies, researchers, and many others. Years later researchers may use coop observations to study climate trends. The blank that seems reasonable today may make no sense to someone looking at the weather observation in a different place or time. Did the observer forget to fill in this column? Was something wrong with the equipment? Was there precipitation, or not? A zero removes doubt.

Who would care about a day with no rain? Those who care about drought do. Drought is a prolonged dry period in a natural climate cycle. In agricultural communities drought is one of



many natural threats. Drought affects the growing season, water management, stream flow and navigation, and drought also has the potential to impact people in metropolitan areas. In extreme conditions drought may lead to population displacement, water and food shortages, and long term environmental, economic, and health impacts.

According to Illinois State Climatologist Jim Angel, "reporting zeroes is critical for monitor-

...The blank that seems reasonable today may make no sense to someone looking at the weather observation in a different place or time...

(Continued on page 7)

What is Metadata?

Terry Simmons

I know the weather information recorded on coop forms is considered data, but what is metadata?

Metadata is basically data about data. It is structured information to describe the characteristics, physical attributes, contents, and the location of data resources. In essence metadata answers questions related to who, what, when, where, why, and how of data being documented.

Where is metadata?

Metadata information is documented in a manner similar to resource information found in card catalogs at libraries or archival databases at museums. Weather, water, and climate metadata and resource information is stored at the National Climatic Data Center, the U.S. Geological Service, the Geospatial Data Clearinghouse, and other locations.

Why create metadata?

Metadata help verify site-specific information. It can contain descriptions, photos, dates, or point of reference that can be stored and managed in a database. There are thousands of weather observing sites across the nation and each one has documentation to indicate where

it is located, when the site was established, what type of data are provided, and the time these data are collected.

Who cares about metadata?

Scientists and researchers interested in weather and climate care about metadata. Metadata provide valuable hints about how, what, and why something may occur - kind of like using clues to conduct a CSI-type investigation for weather and climate. Metadata can be used to: assess whether observations from different locations can be compared; identify how data are gathered; and help determine what conclusions can be justified.

Why use metadata?

Metadata allow people to determine whether the resources are likely to be useful to them. Metadata from a coop site can tell researchers how long observations have been recorded at a particular location, whether the source of the weather observation is an individual or institution, and the type of data reported. Metadata describe characteristics of the observing site such as terrain and exposure (i.e. mostly level farmland or sparsely wooded suburban setting),

(Continued on page 8)

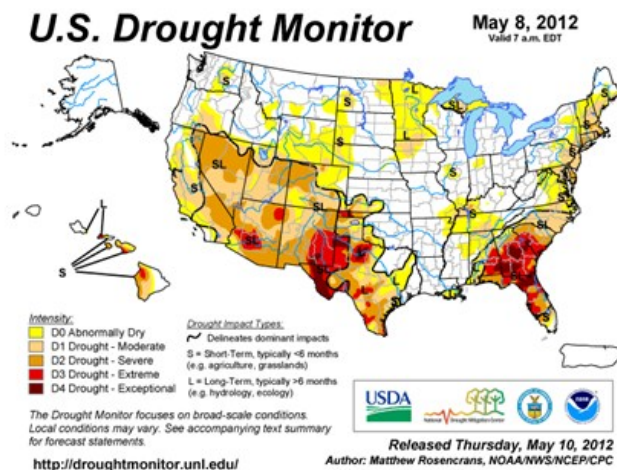
...metadata answers questions related to who, what, when, where, why and how of data being documented...

The Power of None: Why Zeros Matter

(Continued from page 6)

ing and researching drought conditions, more so than trends. That's because drought is the one thing where you need positive proof that it did not rain. You can't make assumptions based on a lack of reports."

Zero is a meaningful value and important report for climate. Documenting how widespread dry conditions have become is just one part of a regional drought early warning system.



..."drought is one thing where you need positive proof that it did not rain"...

More information on drought is available at:

www.drought.gov

What is Metadata?

(Continued from page 7)

...Metadata also provide details on the type of equipment... time of observation... and how the observation is transferred to the weather office.

document the location of equipment, and describe the direction and distance to any obstructions. Metadata also provide details on the type of equipment used to take the measurement, the time the observation is to be taken, and how the observation is transferred to the weather office (i.e. a daily phone call, computer entry, or a paper form which is mailed to the office at the end of the month).

When are metadata compiled?

Before metadata are compiled, a need for data must be documented. For example, when a new weather observing site is proposed a technician may visit the location to document latitude, longitude, and elevation, and determine whether there is a suitable place without obstructions for equipment. The information gathered would then be shared with other individuals, such as a state climatologist or a hydrologist at a river forecast center, who also decide whether data from the proposed location would satisfy their needs. It is helpful when the proposed site is in a

data sparse region, but not as helpful when there are already several data sources in the vicinity.

Are metadata updated?

Metadata can be created and maintained either by automated information processing or by manual work. For sites that are already established, a technician may periodically review metadata and document changes in the database. Occasionally, the technician may travel to the site with a GPS device to check the latitude and longitude, take photos, and make certain equipment exposure is still good.

Why would it be necessary to check the exposure at a coop site?

Exposure is checked mainly to reveal the source of data discrepancies. Things change, and if a coop site has been in one location for many years the trees which were small when the site was established may be large enough to shade the sensors, new buildings may be closer to the equipment now, or some of the previous obstructions may be gone.

Summer Safety and Awareness

Sara Schultz

For more information and tips on preventing heat-related illnesses, contact your local American Red Cross or visit:

www.nyredcross.org/?nd=summer_heat_safety_guide

As summer comes into full swing in the upcoming months, so does the active weather and heat. You want to be prepared not only for dangerous weather such as flash floods, tornadoes, lightning, and winds; but for warmer temperatures and the sun. A hot, dry summer day can be just as dangerous and deadly as severe weather.

The National Weather Service during the summer will issue different products for heat. Forecasters decide whether or not to issue heat products based on upcoming weather conditions and the heat index. The heat index is when the relative humidity is factored into the actual air temperature and is a measure of how it affects the body.

Just like a thunderstorm needs the proper fuel to

sustain (water vapor); so does the human body. Certain foods and drinks will hinder body functions and can make it difficult to do even basic tasks.

Dehydration and heat-related illnesses are a big factor during the summer and precautions need to be taken to avoid them. One of the main things to remember when is to stay well hydrated. Make sure to drink plenty of water and keep caffeine and alcohol consumption low. Alcohol can dehydrate the body since it is a diuretic and increases urination, which makes you lose more water, electrolytes, and minerals than you would normally. Not being aware of weather conditions outdoors can lead to heat cramps, heat exhaustion, and heat stroke.

Summer Safety and Awareness

(continued from page 8)

NOAA's National Weather Service

Heat Index

Temperature (°F)

	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution Extreme Caution Danger Extreme Danger

Information on heat-related products can be found at:

www.nws.noaa.gov/om/heat/index.shtml

National Weather Service Heat Related Products

- Heat Outlook:

issued when the potential for excessive heat exists in the next 3-7 days
- Heat Advisory:

issued when heat indices are greater than 100°F for 1 to 2 days, along with a nighttime low temperatures greater than 75°F
- Excessive Heat Watch:

issued when conditions are favorable for an excessive heat event in the next 12-48 hours with heat indices greater than 105°F during the day combined with nighttime low temperatures of 80° F or higher for 2 consecutive days
- Excessive Heat Warning:

issued when excessive heat event is expected in the next 12 hours with heat indices at least 105°F for more than 3 hours per day for 2 consecutive days, or heat indices greater than 115°F for any period of time.

Mild Winter Leads to Record Warm Spring 2012

David Sheets

Mild Winter

The winter season of 2011-2012 was notably warm and mild across eastern Iowa, northwest Illinois and far north-east Missouri. The average temperature for the months of December, January and February was around 6 degrees above normal at both Moline and Dubuque.

The season also had well below normal snowfall totals, as shown in the graph in the middle to the right. Snowfall totals at Dubuque and Moline were roughly 10 to 16 inches below normal.

This mild weather broke a five year stretch of colder than normal winter seasons. The last time the region had a warmer than normal winter was during the 2006-2007 season.

Record Warm Spring

The mild weather continued into the spring months of 2012. At both Moline and Dubuque, temperatures averaged nearly 7 degrees above normal in March, April and May. This set a record for the warmest spring at both sites. At the Quad City International Airport in Moline, the average temperature was 57.3, which exceeded the old record of 56.4 degrees set in spring 1977.

While March was by far the most exceptionally warm month (see "Warmest March on Record" in this issue), April and May were also warm, but to a lesser extent. As can be seen in the table on the left, March was around 14 degrees above normal, while April was around 1 above, and May around 4 above at both Moline and Dubuque.

Will the Warmth Continue?

The latest outlook for June from the NWS' Climate Prediction Center suggest the warm weather will continue. It indicates there is a 40 percent chance of above normal temperatures for the month. Through the rest of the summer season, however, it appears too close to call, with equal chances for above normal, near normal or below normal temperatures.

Monthly Average Temperatures

Dubuque

Average Departure

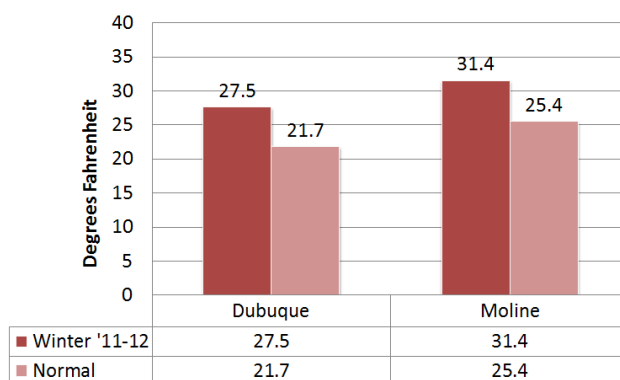
March	50.2	+14.8
April	48.9	+0.7
May	63.1	+4.3

Moline

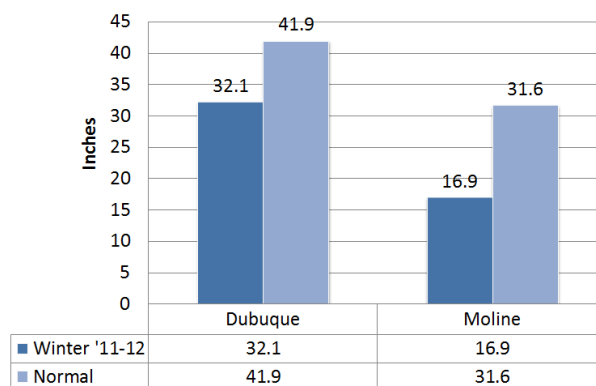
Average Departure

March	53.3	+14.2
April	52.4	+1.0
May	61.8	+4.4

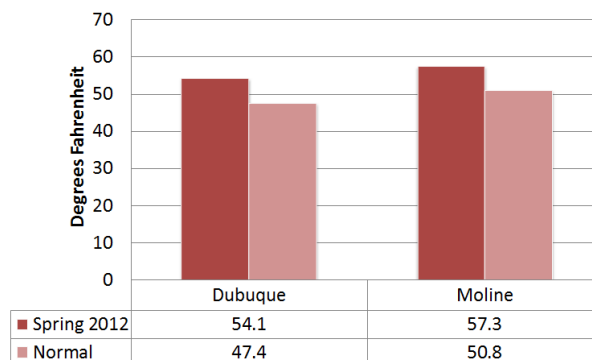
Average Temperatures
Winter 2011-2012



Seasonal Snowfall 2011-2012



Average Temperatures
Spring 2012



River Forecast Webpage Enhancements

Maren Stoflet

Several enhancements have recently been made for accessing the National Weather Service river level and forecast information on the web. These enhancements include a Google Maps based interface that allows easier navigation for your area of interest, and quicker access to view the latest river stages and forecast river stages at each location.

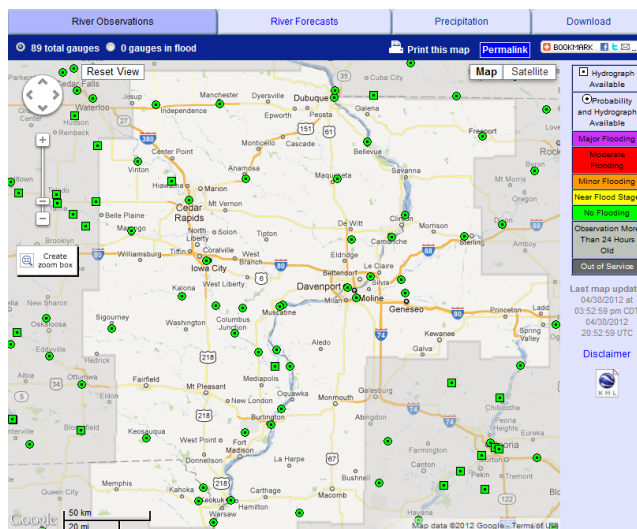
In another effort, the NWS Quad Cities and the Iowa Flood Center (IFC) at The University of Iowa, have partnered again to make flood inundation maps more accessible. As a result of this partnership, Cedar River flood inundation maps for the Cedar Rapids area are now available on the National Weather Service website.

Flood inundation maps can be a helpful tool to visualize the potential extent of flooding at various river levels. These detailed maps provide information that can assist in planning and mitigation decisions, as well as enable communities and individuals to make informed decisions about their flood risks.

The Cedar River inundation maps for the Cedar Rapids area are available, in addition to the already available Iowa River flood inundation maps for the Iowa City area. Check them both out at:

water.weather.gov/ahps/inundation.php

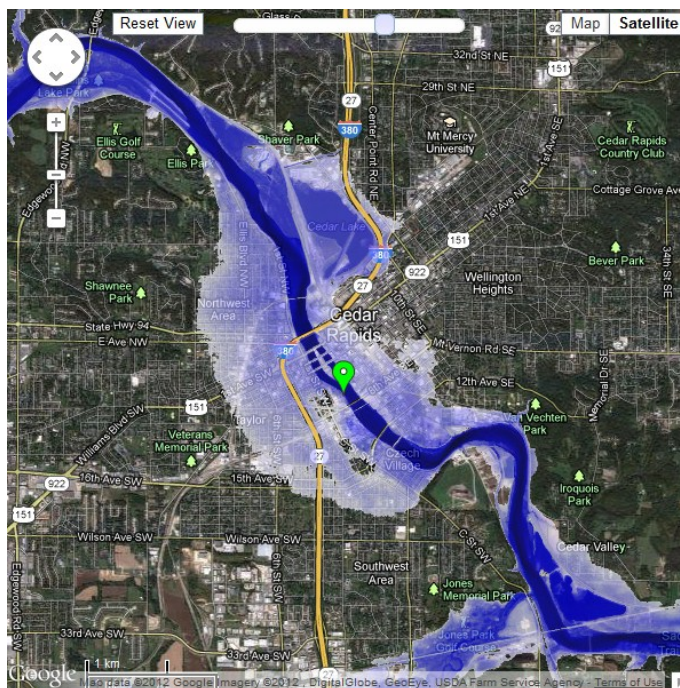
Flood inundation map of the Cedar River in Cedar Rapids, Iowa. This map recently joined the Iowa River in Iowa City on the web with detailed flood data.



Google-based web interface map of river and forecast information for eastern Iowa and northwest Illinois. Each green dot allows access to the latest river stages and forecasts for those locations.

This web interface can be found at this address:

water.weather.gov/ahps2/index.php?wfo=dvn



Smart phone users may find more information via the above link.

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National Weather Service Quad Cities IA/IL

Weather Home Companion

Inside this issue:

- ***Warmest March on Record***
- ***Weather-Ready Nation***
- ***Dual Polarization Radar***
- ***Radar Hardware Changes***
- ***New Fischer-Porter Automated Rain Gauges Installed***
- ***WxCODER***
- ***The Power of None: Why Zeros Matter***
- ***What is Metadata?***
- ***Summer Safety and Awareness***
- ***Mild Winter Leads to Record Warm Spring 2012***
- ***River Forecast Webpage Enhancements***